IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (currently amended) An optical communication ~~system~~apparatus, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

a detection unit detecting signal light extracted by the optical tunable filter; and

a control signal generating unit generating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength by the detection unit, based on a detected result obtained by shifting a wavelength transmission characteristic of the optical tunable filter in a wavelength band including all segments of the multiplexed signal light.

2. (currently amended) The optical communication ~~system~~apparatus according to claim 1, wherein

said control signal generating unit generates the control signal needed to extract the signal light with a desired wavelength, based on both the detected result and information indicating a current operating situation of the multiplexed signal light.

3. (currently amended) An optical communication ~~system~~apparatus, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

a detection unit detecting signal light extracted by the optical tunable filter;

an operation unit operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on a detected result of two segments of signal light at each edge of the wavelength band

obtained by the shifting of the detection unit when shifting a wavelength transmission characteristic of the optical tunable filter from outside a wavelength band including all segments of the multiplexed signal light; and

a control signal generating unit generating the control signal according to the designation information.

4. (currently amended) The optical communication ~~system~~apparatus according to claim 3, wherein

said operation unit executes the computation, based on both the detected result and information indicating a current operating situation of the multiplexed signal light.

5. (original) An optical communication system, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

a detection unit detecting signal light extracted by the optical tunable filter;

an optical wavelength detecting unit detecting signal light with a specific wavelength of all segments of signal light extracted by the optical tunable filter;

an operation unit operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on both a detected result of the detection unit and the optical wavelength detecting unit and information indicating a current operating situation of the multiplexed signal light; and

a control signal generating unit generating the control signal according to the designation information.

6. (original) An optical communication system, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

a detection unit detecting signal light extracted by the optical tunable filter;

a reference signal light detecting unit detecting reference signal light that is known to be always included in signal light inputted to the optical tunable filter of all segments of signal light extracted by the optical tunable filter;

an operation unit operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on both a detected result of the detection unit and a detected result of the reference signal light detecting unit; and

a control signal generating unit generating the control signal according to the designation information.

7. (original) The optical communication system according to claim 5, wherein

said optical wavelength detecting unit performs the detection of signal light with a specific wavelength of the multiplexed signal light.

8. (original) The optical communication system according to claim 5, wherein

said optical wavelength detecting unit comprises a periodic filter whose free spectrum range (FSR) is the same as a wavelength interval between two segments of adjacent signal light of the multiplexed signal light and whose peak of a wavelength transmission characteristic coincides with a wavelength of the signal light.

9. (original) The optical communication system according to claim 8, wherein

full width at half maximum (FWHM) and finesse of said periodic filter are between 0.1nm and 0.3nm and between 3 and 8, respectively.

10. (original) The optical communication system according to claim 8, further comprising

a control unit controlling a change of wavelength transmission characteristic of said optical tunable filter in such a way as to increase amount of light of signal light that transmits said periodic filter.

11. (original) An optical communication system, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

an optical wavelength detecting unit detecting signal light with a specific wavelength of all segments of signal light extracted by the optical tunable filter;

an operation unit operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on both a detected result of the light detection unit and information indicating a current operating state of the multiplexed signal light; and

a control signal generating unit generating the control signal according to the designation information.

12. (original) The optical communication system according to claim 5, wherein

said optical wavelength detecting unit comprises a periodic filter and

said operation unit operates to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on detected results of two segments of signal light at each edge of the wavelength band that is transmitted through the periodic filter and is obtained by shifting when shifting the wavelength transmission characteristic of the optical tunable filter from outside a wavelength band including all segments of the multiplexed signal light.

13. (currently amended) The optical communication ~~system~~apparatus according to claim 3, wherein

when receiving no instruction to extract signal light, said operation unit operates to generate in advance the designation information needed to select and extract one arbitrary segment of signal light from the multiplexed signal light, and when receiving the instruction later, said operation unit operates to generate the control signal needed to extract the designated signal light, based on information obtained up to then.

14. (currently amended) The optical communication ~~system~~apparatus according to claim 3, wherein

when the instruction to extract signal light is modified, said operation unit operates to generate the designation information needed to extract modified designated signal light, based on information obtained prior to the reception of the modified instruction.

15. (currently amended) The optical communication ~~system~~apparatus according to claim 3, wherein

when determining the existence/non-existence of signal light, based on a detected result of said detection unit, said operation unit sets a reference of the determination, based on a signal level detected by said detection unit when a wavelength transmission characteristic of said optical tunable filter is set so that signal light with a wavelength located outside a wavelength band including all segments of the multiplexed signal light can be transmitted.

16. (currently amended) The optical communication ~~system~~apparatus according to claim 15, wherein

when determining the existence/non-existence of signal light, based on a detected result of said detection unit, said operation unit determines a target signal not to be signal light if the size of a target signal level is less than the predetermined value.

17. (currently amended) The optical communication ~~system~~apparatus according to claim 16, wherein

said operation unit maintains a maximum signal level of signal light detected by the shift of said detection unit when shifting the wavelength transmission characteristic of said optical tunable filter in a range where the size of a target signal level exceeds the predetermined value, and if said detection unit detects the decrease of a signal level from the maximum value by more than a predetermined value when continuing to shift the wavelength transmission characteristic in a predetermined range after detecting the maximum value, said operation unit regards the control signal generated by said control signal generating unit when detecting the maximum value as an optimal control signal to be applied to said optical tunable filter to extract the signal light, and performs the computation.

18. (original) The optical communication system according to claim 5, wherein

when receiving no instruction to extract signal light, said operation unit operates to generate in advance the designation information needed to select and extract one arbitrary segment of signal light from the multiplexed signal light, and when receiving the instruction later, said operation unit operates to generate the control signal needed to extract the designated signal light, based on information obtained up to then.

19. (original) The optical communication system according to claim 5, wherein

when the instruction to extract signal light is modified, said operation unit operates to generate the designation information needed to extract modified designated signal light, based on information obtained prior to the reception of the modified instruction.

20. (original) The optical communication system according to claim 5, wherein

when determining the existence/non-existence of signal light, based on a detected result of said detection unit, said operation unit sets a reference of the determination, based on a signal level detected by said detection unit when a wavelength transmission characteristic of said optical tunable filter is set so that signal light with a wavelength located outside a wavelength band including all segments of the multiplexed signal light can be transmitted.

21. (original) The optical communication system according to claim 20, wherein

when determining the existence/non-existence of signal light, based on a detected result of said detection unit, said operation unit determines a target signal not to be signal light if the size of a target signal level is less than the predetermined value.

22. (original) The optical communication system according to claim 21, wherein

said operation unit maintains a maximum signal level of signal light detected by the shift of said detection unit when shifting the wavelength transmission characteristic of said optical tunable filter in a range where the size of a target signal level exceeds the predetermined value, and if said detection unit detects the decrease of a signal level from the maximum value by more

than a predetermined value when continuing to shift the wavelength transmission characteristic in a predetermined range after detecting the maximum value, said operation unit regards the control signal generated by said control signal generating unit when detecting the maximum value as an optimal control signal to be applied to said optical tunable filter to extract the signal light and performs the computation.

23. (original) A method for controlling an optical tunable filter, comprising:

detecting signal light extracted by the optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method; and

generating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on the detected result obtained by shifting the wavelength transmission characteristic of the optical tunable filter in a wavelength band including all segments of the multiplexed signal light.

24. (original) A method for controlling an optical tunable filter, comprising:

detecting signal light extracted by the optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

generating information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on a detected result of two segments of signal light at each edge of the wavelength band obtained by the detecting result when shifting a wavelength transmission characteristic of the optical tunable filter from outside a wavelength band including all segments of the multiplexed signal light; and

generating the control signal according to the designation information.

25. (original) A method for controlling an optical tunable filter, comprising:

performing the first detection of detecting signal light extracted by the optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal,

transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

performing the second detection of detecting signal light with a specific wavelength of all segments of signal light extracted by the optical tunable filter;

generating information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on both the detected results of the first and second detection and information indicating a current operating situation of the multiplexed signal light; and

generating the control signal according to the designation information.

26. (original) A method for controlling an optical tunable filter, comprising:

detecting signal light extracted by the optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

detecting reference signal light that is known to be always included in signal light inputted to the optical tunable filter of all segments of signal light extracted by the optical tunable filter;

generating information for designating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on both a detected result of the signal light and a detected result of the reference signal light; and

generating the control signal according to the designation information.

27. (original) A method for controlling an optical tunable filter, comprising:

detecting signal light with a specific wavelength of all segments of signal light extracted by the optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

generating information for designating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on both the detected result and information indicating a current operating state of the multiplexed signal light; and

generating the control signal according to the designation information.

28. (currently amended) An optical communication ~~system~~apparatus, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

detection means for detecting signal light extracted by the optical tunable filter ; and

control signal generating means for generating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength by the detection means, based on a detected result obtained by shifting a wavelength transmission characteristic of the optical tunable filter in a wavelength band including all segments of the multiplexed signal light.

29. (currently amended) An optical communication ~~system~~apparatus, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

detection means for detecting signal light extracted by the optical tunable filter;

operation means for operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on a detected result of two segments of signal light at each edge of the wavelength band obtained by the shifting of the detection means when shifting a wavelength transmission characteristic of the optical tunable filter from outside a wavelength band including all segments of the multiplexed signal light; and

control signal generating means for generating the control signal according to the designation information.

30. (original) An optical communication system, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

detection means for detecting signal light extracted by the optical tunable filter;

optical wavelength detecting means for detecting signal light with a specific wavelength of all segments of signal light extracted by the optical tunable filter;

operation means for operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a designated wavelength, based on both a detected result of the detection means and the optical wavelength detecting means and information indicating a current operating situation of the multiplexed signal light; and

control signal generating means for generating the control signal according to the designation information.

31. (original) An optical communication system, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

detection means for detecting signal light extracted by the optical tunable filter;

reference signal light detecting means for detecting reference signal light that is known to be always included in signal light inputted to the optical tunable filter of all segments of signal light extracted by the optical tunable filter;

operation means for operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on both a detected result of the detection means and a detected result of the reference signal light detecting means; and

control signal generating means for generating the control signal according to the designation information.

32. (original) An optical communication system, comprising:

an optical tunable filter, whose wavelength transmission characteristic varies depending on a control signal, transmitting and extracting signal light with a specific wavelength from signal light multiplexed by a wavelength-division multiplexing (WDM) method;

optical wavelength detecting means for detecting signal light with a specific wavelength of all segments of signal light extracted by the optical tunable filter;

operation means for operating to generate information for designating the control signal needed to enable the optical tunable filter to extract signal light with a predetermined wavelength, based on both a detected result of the optical detection means and information indicating a current operating state of the multiplexed signal light; and

control signal generating means for generating the control signal according to the designation information.